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conductor strips and wherein the housing of the electronic module further forms the housing of the at least one fuse.

## REMARKS

Entry of the foregoing Amendment is respectfully requested.

By the present amendment, the drawings, Fig. 2a, are amended to insert a missing alphabetic reference "thickness d" disclosed in the specification (Fig. 2a) and to overcome the objections of the Examiner thereto by modifying the alphabetic designation for south and north poles from "S" to "SP" and "N" to "NP" (Fig. 2a). Claims 2 and 6 are canceled. Claim 1 is amended to include the limitations of the cancelled claims.

Based on the foregoing amendments and the following remarks, the application is deemed to be in condition for allowance and action to that end is respectfully requested.

### I. Objections to the Drawings

The Examiner objected to the drawings under 37 C.F.R. §1.84(p)(5) and (4) for not showing the reference sign mentioned in the description "thickness d" and because "S" has been used to designated both south pole in Fig. 2a,

respectively . As noted above, Fig. 2a is amended to overcome all of the objections of the Examiner to the drawings. Approval of the amended Fig. 2a (copies, together with a letter to the Official Draftsperson, being enclosed) is respectfully requested.

## II. Rejection of Claims

The Examiner rejected claims 1,3, 4, 6, 8 and 9 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,470,873 (Nakamura) in view of U.S. Patent No. 4,831,484 (Bruch) and BEI Motion Systems Company (Optical Encoder Design Guide). The Examiner rejected claim 2 under 35 U.S.C. §103(a) as being unpatentable over Nakamura in view of Bruch and BEI Motion Systems Company and further in view of JP 11-273520 (Yoshikawa). The Examiner rejected claims 5and 7 under 35 U.S.C. §103(a) as being unpatentable over Nakamura in view of Bruch and BEI Motion Systems Company and further in view of U.S. Patent No. 4,369,578 (Ernst). It is respectfully submitted that all of the claims presently pending in the application are patentably distinct over the prior art, including all of the prior art of record in the application, and are, therefore, allowable.

The combination of the cited prior art does not lead to the claimed invention nor does such a combination provide the advantages of the invention. In particular, as disclosed in the specification, at page 2, line 20-page 3, line 2, it is usually not possible to shield the probe of a position measuring system. It is only possible to shield the electronic module of the system. The invention provides a cost effective solution for building a measuring system usable in explosive environments. Such a solution is possible with probes that are not shielded by a housing.

Considering the prior art, BEI Motion Systems Company teaches housings that shield the complete measuring system, including the electronic module, the probe and the scale graduation (see Figure 5, page 5). The housing claimed in the present invention only shields the electronic module (...a housing for shielding the electronic module...). Figure 3, of the specification of the present invention, also shows that the probe is outside the housing. In view of the above, it is respectfully submitted that BEI Motion Systems Company does not disclose or suggest the present invention, as defined by the claims, and the claims are patentable over BEI Motion Systems Company.

Bruch shows a safety barrier that limits the current to an external sensor exposed to hazardous locations. The safety barrier limits the current via an expensive electronic circuit, using Zener diodes (reference 9 in Figure 1) and an inline control element (reference 11 in Figure 1) which limits the current (col. 3, lines 52-53). Such prior art is mentioned in the present application, on page 3, lines 2-6. Such prior art is not simple and cost effective as the present invention, wherein, according to claim 1, the means for limiting the current to the probe are at least one fuse in electrical connections. As explained, the current limitation of Bruch is not done with a fuse. In view of the above, it is respectfully submitted that Bruch does not disclose or suggest the present invention, as defined by the claims, and the claims are patentable over Bruch.

Nakamura shows a magnetic sensor with magneto resistive elements. As the Examiner concedes, however, Nakamura is silent regarding a housing for the electronic module and a fuse for limiting the current to the probe. In view of the above, it is respectfully submitted that Nakamura does not disclose or suggest the present invention, as defined by the claims, and the claims are patentable over Nakamura. As discussed above, neither BEI Motion Systems

Company or Bruch lead to the claimed scanning device for a position measuring system.

As to Yoshikawa, the fuses described therein are separate parts that have to be added into a system. Such a system is not as cost effective as the fuses of the present invention, wherein, the fuse is formed by a construction of a cross section of electrical connections and the electrical connections comprise conductor strips, as recited in amended claim 1. The electrical connections with "integrated fuses" have a double function and, accordingly, lower the complexity and costs of the system as a whole.

There is no suggestion in the cited prior art that would lead one of ordinary skill in the art of position measuring systems to attempt a combination of these references to achieve the invention as claimed in amended claim 1, which incorporates the limitations of former claims 2 and 6.

The Board of Patent Appeals and Interferences held that when the references do not suggest the claimed combination.

"... the Examiner must present a convincing line of reasoning as to why the artisan would have found the

claimed combination to have been obvious in light of the teachings of the references (emphasis added)." Ex Parte Clapp, 227 U.S.P.Q. 973 (POB Pat App U& Inter. 1985).

No such reasoning is found in the Office Action.

Claims 3-5 and 7-9 depend on claim 1 and are allowable for the same reasons claim 1 is allowable and further because of specific features recited therein which, when taken alone and/or in combination with the features recited in claim 1, are not disclosed or suggested in the prior art.

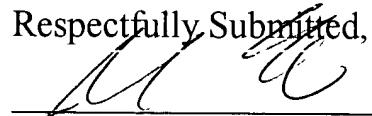
### **CONCLUSION**

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance, and allowance of the application is respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawings be further amended or corrected in formal respects, in order to place the case in condition for final allowance, then it is respectfully requested that such amendment or correction be carried out by Examiner's amendment and the case passed to issue. Alternatively, should the

Examiner feel that a personal discussion might be helpful in advancing this case to allowance, the Examiner is invited to telephone the undersigned.

Respectfully Submitted,

  
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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail and addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on March 26, 2002.



## CLAIMS

### WHAT IS CLAIMED IS:

1. A scanning device for a position measuring system for scanning a scale graduation comprising:
  - a probe being operatively connected with the scale graduation and being supplied with electric power over a plurality of electrical connections;
  - an electronic module being electrically coupled to the probe;
  - a housing of the electronic module for shielding the electronic module from the surroundings; and
  - means for limiting the supply of current to the probe, wherein at least one fuse is provided in the electrical connections, leading to the probe, within the housing, for interrupting the flow of current to the probe when the temperature produced as a result of the current flow exceeds a specific value, wherein the fuse is formed by a sectional constriction of a cross section of the electrical connections and the electrical connections comprise conductor strips and wherein the housing of the electronic module further forms the housing of the at least one fuse.
- [2. The scanning device of claim 1, wherein the fuse is formed by a sectional constriction of a cross section of the electrical connections.]
3. The scanning device of claim 1, wherein the fuse is formed by a section of the electrical connections having an electrically conductive material of at least one of a lower melting point and a higher specific resistance.

4. The scanning device of claim 1, wherein the fuse is disposed behind the electric connections that are between the probe and the electronic module and within the housing.
5. The scanning device of claim 1, wherein a fuse is provided for each of the electrical connections extending partially outside of the housing.
- [6. The scanning device of claim 1, wherein the electrical connections comprise conductor strips.]
7. The scanning device of claim 1, wherein the housing comprises aluminum.
8. The scanning device of claim 1, wherein the probe scans the scale graduation according to at least one of the inductive principle of measurement, the magnetic principle of measurement and the photoelectric principle of measurement.
9. The scanning device of claim 8, wherein the probe is a magnetoresistive probe.